

Data Insertion, Updating and Deletion

Duration: 3 hrs

Detailed Syllabus

- 4.4.1 Inserting Data: INSERT INTO [VALUES|SELECT] including a column list, null values; obtaining values from a SELECT.

- 4.4.2 Updating Data: UPDATE (selected columns, selected rows, with a sub query).

- 4.4.3 Deleting Data: DELETE (all data, selected data, with a sub query).

Command: INSERT

- Function
 - *Places data one or more rows into a table*
 - *Data can also be downloaded from another computer system or collected from other sites.*

INSERT INTO *table-name* (*column-name*),
| VALUES (*constant*, NULL),

or

| SELECT *retrieval condition*

Command: INSERT

i Single-Row Insert

```
INSERT INTO Employee (Emp_No, Emp_Name, Age,  
Dept)  
VALUES ('E1', 'Dias', 26, 'PER')
```

ii Multi-Row Insert

```
INSERT INTO Manager (Emp_No, Emp_Name, Age, Dept)  
SELECT Emp_No, Emp_Name, Age, Dept  
FROM Employee  
WHERE Job = 'Manager'
```

RESTRICT INSERT

Insert with referential
integrity

In Employee Table

```
CONSTRAINT Emp_Dep_FK  
FOREIGN KEY (Dept) REFERENCES  
Department(Dept_Code)
```

```
INSERT INTO Employee  
VALUES (342, 'Dias', 26, 'Sale');
```

An employee can only be inserted if its department is found in department table

RESTRICT INSERT

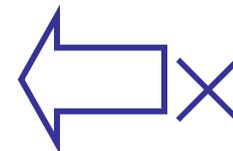
Department

Dept_Code	Dep_Name	Manager
SAL	Sales	179
FIN	Finance	857



Employee

Emp_No	Emp_Name	Age	Dept
179	Silva	27	SAL
857	Perera	34	FIN
342	Dias	26	Sale



Command: UPDATE

- Function: *Changes data in one or more rows of a table*

UPDATE *table-name*

SET (*column-name = expression*),

WHERE *search-condition*

Example

```
UPDATE STUDCLASS  
SET FEES = 1200  
WHERE STUDNO = 1234
```

Selective Update

```
UPDATE STUDCLASS  
SET FEES = 1200
```

Update All Rows

Command: UPDATE

Example

Update with Subquery

```
UPDATE Works_On  
SET Hours = 12  
WHERE Proj_No IN(SELECT Proj_No FROM Project  
WHERE Proj_Name = 'INFORMATION TECHNOLOGY')
```

```
UPDATE Employee  
SET Age = Age+1
```

RESTRICT UPDATE

Update with referential integrity

In Employee Table

CONSTRAINT Emp_Dep_FK

FOREIGN KEY (Dept) **REFERENCES**

Department(Dept_Code) **ON UPDATE RESTRICT**

UPDATE Department **SET** Dept_Code = 'Sale'

WHERE Dept_Code = 'SAL'

A department code can only be changed if it is not found in employee table (i.e. no employees working for them)

RESTRICT UPDATE

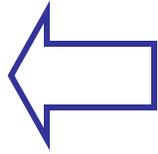
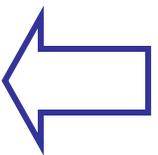
Department

Dept_Code	Dep_Name	Manager
SAL	Sales	179
FIN	Finance	857



Employee

Emp_No	Emp_Name	Age	Dept
179	Silva	27	SAL
857	Perera	34	FIN
342	Dias	26	SAL



CASCADE UPDATE

Update with referential integrity

In Employee Table

CONSTRAINT Emp_Dep_FK

FOREIGN KEY (Dept) **REFERENCES**

Department(Dept_Code) **ON UPDATE CASCADE**

UPDATE Department **SET** Dept_Code = 'Sale'

WHERE Dept_Code = 'SAL'

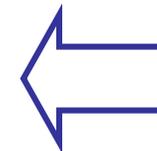
Updating a department code will result in changing it in the employee table (update with new department code for the employees working for them)

CASCADE UPDATE



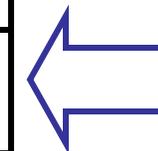
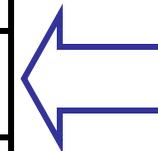
Department

Dept_Code	Dep_Name	Manager
Sale	Sales	179
FIN	Finance	857



Employee

Emp_No	Emp_Name	Age	Dept
179	Silva	27	Sale
857	Perera	34	FIN
342	Dias	26	Sale



SET NULL UPDATE

Update with referential integrity

In Employee Table

CONSTRAINT Emp_Dep_FK
FOREIGN KEY (Dept) **REFERENCES**

Department(Dept_Code) **ON UPDATE SET NULL**

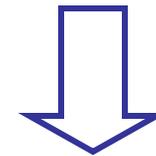
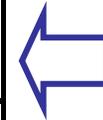
UPDATE Department **SET** Dept_Code = 'Sale'
WHERE Dept_Code = 'SAL'

Updating a department code will result in changing the department code of their employees to NULL (only if NULL values are allowed)

SET NULL UPDATE

Department

Dept_Code	Dep_Name	Manager
Sale	Sales	179
FIN	Finance	857



Employee

Emp_No	Emp_Name	Age	Dept
179	Silva	27	NULL
857	Perera	34	FIN
342	Dias	26	NULL

SET DEFAULT UPDATE

Update with referential integrity

In Employee Table

CONSTRAINT Emp_Dep_FK

FOREIGN KEY (Dept) **REFERENCES**

Department(Dept_Code) **ON UPDATE**

SET DEFAULT 'XXX'

UPDATE Department **SET** Dept_Code = 'Sale'
WHERE Dept_Code = 'SAL'

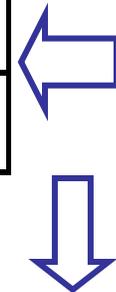
Updating a department code will result in changing the department code of their employees to a default value

SET DEFAULT UPDATE



Department

Dept_Code	Dep_Name	Manager
Sale	Sales	179
FIN	Finance	857



Employee

Emp_No	Emp_Name	Age	Dept
179	Silva	27	XXX
857	Perera	34	FIN
342	Dias	26	XXX

Command: DELETE

- Function: *Removes one or more rows from a table*

DELETE FROM *table-name*

{**WHERE** *search-condition*}

Example

```
DELETE FROM Employee  
WHERE Emp_No = 'E1'
```

Select Delete

```
DELETE FROM Employee
```

Delete All Rows

```
DELETE FROM Dependent  
WHERE Emp_No = (SELECT Emp_No FROM Employee  
WHERE Emp_Name = 'Dias')
```

Delete with Subquery

RESTRICT DELETE

Delete with referential
integrity

In Employee Table

CONSTRAINT Emp_Dep_FK
FOREIGN KEY (Dept) **REFERENCES**
Department(Dept_Code) **ON DELETE RESTRICT**

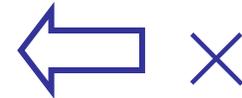
DELETE FROM Department
WHERE Dept_Code = 'SAL'

A department can only be deleted if it is not found in employee table (i.e. no employees working for them)

RESTRICT DELETE

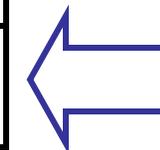
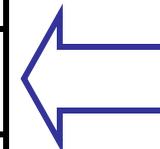
Department

Dept_Code	Dep_Name	Manager
SAL	Sales	179
FIN	Finance	857



Employee

Emp_No	Emp_Name	Age	Dept
179	Silva	27	SAL
857	Perera	34	FIN
342	Dias	26	SAL



CASCADE DELETE

Delete with referential integrity

In Employee Table

```
CONSTRAINT Emp_Dep_FK  
FOREIGN KEY (Dept) REFERENCES  
Department(Dept_Code) ON DELETE CASCADE
```

```
DELETE FROM Department  
WHERE Dept_Code = 'SAL'
```

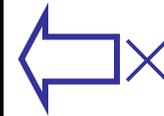
Deleting a department will result in deleting it from the employee table (delete employees working for them)

CASCADE DELETE



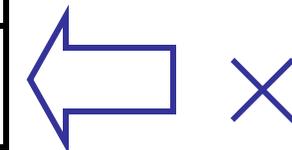
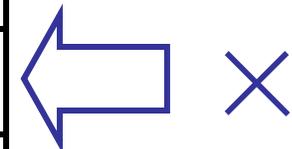
Department

Dept_Code	Dep_Name	Manager
SAL	Sales	179
FIN	Finance	857



Employee

Emp_No	Emp_Name	Age	Dept
179	Silva	27	SAL
857	Perera	34	FIN
342	Dias	26	SAL



SET NULL DELETE

Delete with referential integrity

In Employee Table

CONSTRAINT Emp_Dep_FK

FOREIGN KEY (Dept) **REFERENCES**

Department(Dept_Code) **ON DELETE SET NULL**

DELETE FROM Department

WHERE Dept_Code = 'SAL'

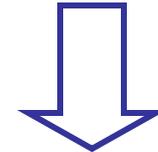
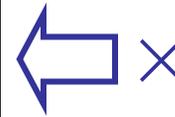
Deleting a department will result in changing the department of their employees in the employee table to **NULL** (only if **NULL** values are allowed)

SET NULL DELETE



Department

Dept_Code	Dep_Name	Manager
SAL	Sales	179
FIN	Finance	857



Employee

Emp_No	Emp_Name	Age	Dept
179	Silva	27	NULL
857	Perera	34	FIN
342	Dias	26	NULL

SET DEFAULT DELETE



Delete with referential integrity

In Employee Table

CONSTRAINT Emp_Dep_FK

FOREIGN KEY (Dept) **REFERENCES**

Department(Dept_Code) **ON DELETE**

SET DEFAULT 'XXX'

DELETE FROM Department

WHERE Dept_Code = 'SAL'

Deleting a department will result in changing the department of their employees in the employee table to a specified default value

SET DEFAULT DELETE

Department

Dept_Code	Dep_Name	Manager
SAL	Sales	179
FIN	Finance	857



Employee

Emp_No	Emp_Name	Age	Dept
179	Silva	27	XXX
857	Perera	34	FIN
342	Dias	26	XXX

